ISSN (print) 0093-4666 © 2015. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

http://dx.doi.org/10.5248/130.191

Volume 130, pp. 191–196 *January–March 2015*

A new species of *Lophodermium* with variously branched paraphyses

Hai-Lin Gu[1], Ya-Fei Xu[1], Dan-Dan Lu[1],
Shi-Juan Wang[2], & Ying-Ren Lin[2]*

[1] *School of Life Science &* [2] *School of Forestry & Landscape Architecture, Anhui Agricultural University, West Changjiang Road 130, Hefei, Anhui 230036, China*

*Correspondence to: *yingrenlin@yahoo.com*

Abstract — *Lophodermium heterocladum*, a new fungus developing on leaves of *Rhododendron cavaleriei*, was collected from the Mount Sanqingshan National Park of Jiangxi Province, China. Description, illustration, and comments are provided for this taxon. The type collection is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, China (AAUF).

Key words — foliicolous fungus, taxonomy, fungal diversity, *Ericaceae*

Introduction

During research on leaf-inhabiting fungi on members of the *Ericaceae* in the Mount Sanqingshan National Park of China, one specimen of the ascomycete family *Rhytismataceae* was obtained. Examination of that material and comparison with previously described species (Lin et al. 2001a,b) led to the conclusion that the specimen represents a new species of *Lophodermium* Chevall. Fifty-seven *Lophodermium* species have previously been reported from China (Hou et al. 2009, Luo et al. 2010, Shi et al. 2010, Chen et al. 2012, Lin et al. 2012, Wang et al. 2012, Chen et al. 2013, Gao et al. 2013, Wang et al. 2014, Lu et al. 2015).

Materials & methods

The conidiomata and ascomata were examined macroscopically with a dissecting microscope at 10–50× magnification. After rehydration in water for ca 10 min, fruiting bodies were cut into 10–15 µm thick sections using a freezing microtome. The sections were mounted in water, KOH solution, Melzer's reagent, cotton blue in water, or lactophenol-cotton blue and examined microscopically. The colors of various structures

were observed in water. Gelatinous sheaths surrounding ascospores and paraphyses were examined in 0.1% (w/v) lactophenol-cotton blue. Measurements were made using material in 5% KOH and from more than 30 paraphyses, asci, ascospores, conidiogenous cells, and conidia for each specimen. Point and line integrated illustrations of external status and internal structures of fruiting bodies were drawn using a microscopic drawing device. The type collection is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, Hefei, China (AAUF).

Taxonomy

Lophodermium heterocladum H.L. Gu & Y.R. Lin, **sp. nov.** Figs 1–8

MycoBank MB 808959

Differs from *Lophodermium implicatum* by its variably shaped paraphyses that branch 1–2(–3) times, the presence of periphysoids and hyphal bridges, and a well-developed subhymenium forming a strongly concave bowl shape.

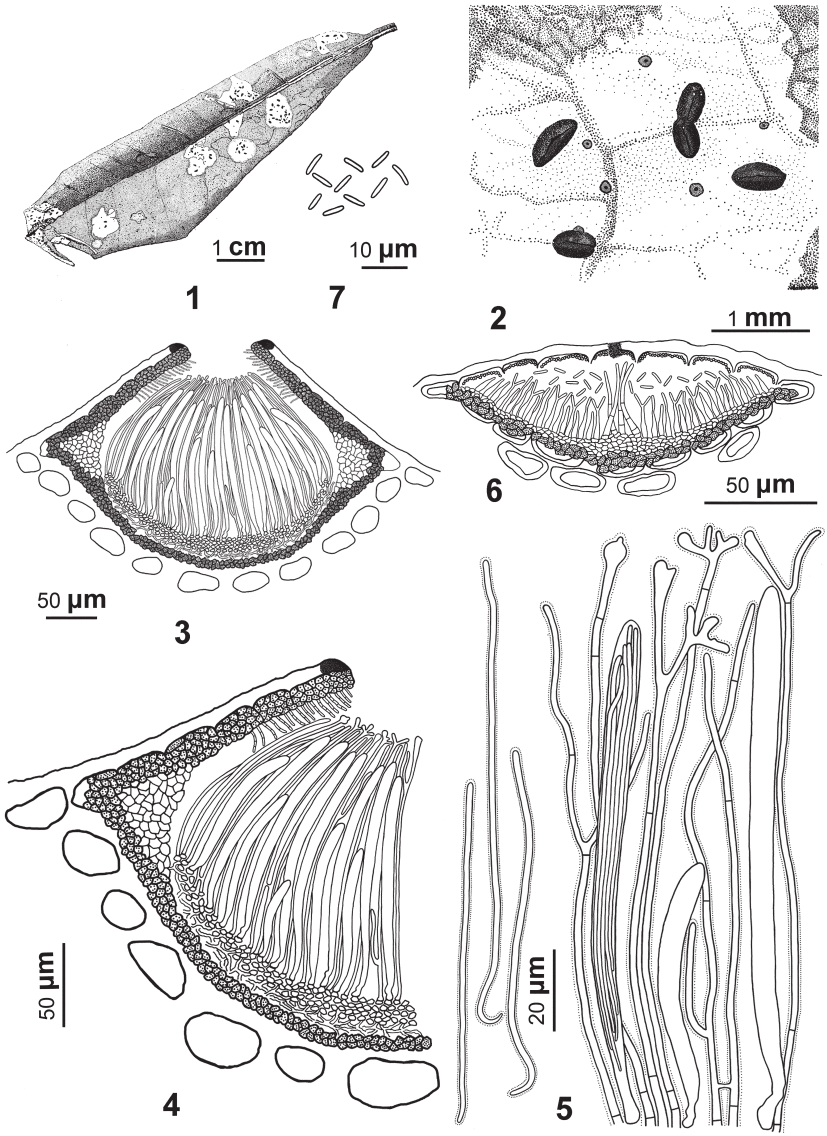
Type: China, Jiangxi, Mount Sanqingshan National Park, Huaiyushan, alt. ca 600 m, on fallen leaves of *Rhododendron cavaleriei* H. Lév. (*Ericaceae*), 18 August 2012, Y.R. Lin, F. Zhou & L. Zhang 2604 (**Holotype,** AAUF 68712).

Etymology: *heterocladum*, referring to variably branched paraphyses of the fungus.

Zone lines absent.

Conidiomata developing on upper side of leaves scattered in pale sandy brown, subcircular or irregular, pale areas with an obvious edge. In surface view, conidiomata 100–170 µm diam., rounded or subrounded, black-brown in the centre and the perimeter line of the conidioma, grey-brown elsewhere, slightly raising the substratum surface, discharging spores through an inconspicuous central ostiole. In median vertical section, conidiomata intraepidermal, lenticular. Upper wall extremely poorly developed, composed of a small amount of tiny angular cells. Basal wall dark brown, consisting of 1–3 layers of 3–5 µm diam., thick-walled angular cells. Subconidiogenous layer 4–10 µm thick, comprised of colorless, thin-walled angular cells 1–3 µm diam. Trichogynes 32–38 × 2.5–3.2 µm, cylindrical, tapering towards the rounded apex, 1–3-septate in the lower half. Conidiophores not observed. Conidiogenous cells 10–14 × 1.8–2.4 µm, ampullaceous, colorless, usually proliferating sympodially and percurrently. Conidia 4–6 × 0.8–1 µm, hyaline, aseptate, cylindrical, sometimes slightly curved, obtuse or round at the ends, smooth-walled.

Ascomata in similar positions to conidiomata on the host, scattered to clustered, occasionally coalescent. In surface view, ascomata 350–680 × 170–360 µm, elliptical, ends round or obtuse, black, slightly shiny, with a clearly marked outline, moderately raising the substratum surface, but slightly sunken near the split, opening by a single longitudinal split which extends almost to the ascomatal edge. Lips absent. In median vertical section, ascomata intraepidermal. Covering stroma 12–20 µm thick, mainly composed of



Figs 1–7. *Lophodermium heterocladum* (holotype) on *Rhododendron cavaleriei.* 1. Habit on a leaf. 2. Detail of fruiting bodies. 3. Ascoma in median vertical section. 4. Portion of ascoma in median vertical section. 5. Paraphyses, asci and ascospores. 6. Conidioma in vertical section. 7. Conidia.

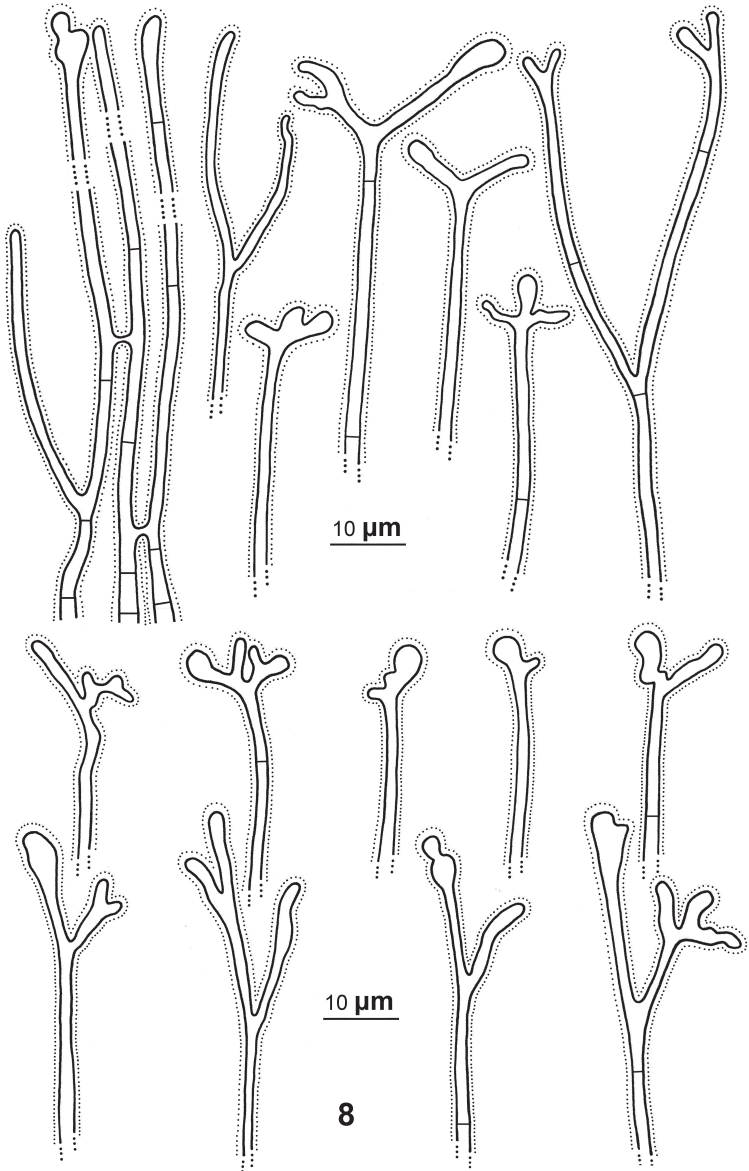


Fig. 8. *Lophodermium heterocladum* (holotype): variously branched paraphyses.

textura angularis with dark brown to black, thick-walled cells 3–5 µm diam., connecting to the basal stroma. There is a 6–8 µm thick mulch which comprises strongly carbonized tissue with no obvious cellular structure outside the top of the covering stroma. Periphysoids lining the inner face of the covering stroma, 5–14 × 1–1.5 µm, cylindrical, not swelling at the apex, hyaline, straight or slightly curved, 0–4-septate. Basal stroma dark-brown, consisting of 1–3 layers of thick-walled angular cells 3–7 µm diam. The triangular space between the covering stroma and basal stroma is filled with hyaline, thin-walled angular cells 4–9 µm diam. Subhymenium well developed, 15–22 µm thick, strongly concave and forming a bowl shape, composed of colorless textura angularis and intricata. Paraphyses 130–155 × 1.5–2.2 µm, filiform, hyaline, thinly septate, mostly gradually or abruptly swollen to 4.2–5.8 µm at the apex, branching 1–2(–3) times often near the top and in the middle or occasionally in the positions not far from the base, sometimes with hyphal bridges near the base between adjacent paraphyses, surrounded by a ca 0.5 µm thick gelatinous matrix. Asci ripening sequentially, 110–140 × 5.5–7.2 µm, cylindrical, apex round, short-stalked, thin-walled, J–, 8-spored. Ascospores arranged in a fascicle, 85–120 × 1.2–1.6 µm, filiform, hyaline, aseptate, straight or slightly curved, apex round or obtuse, hardly tapered towards the round or acute base, with a thin gelatinous sheath.

Host species, habitat, & distribution: Producing conidiomata and ascomata on fallen leaves of *Rhododendron cavaleriei*. Known only from the type locality, Jiangxi Province, China.

Comments — *Lophodermium heterocladum* is very similar to *L. implicatum* Y.R. Lin & Z.S. Xu on *Rhododendron maculiferum* subsp. *anhweiense* (E.H. Wilson) D.F. Chamb. in the way ascomata and conidiomata are embedded and in ascal shape and size. However, *L. implicatum* has ascomata on both surfaces of the leaf, dark brown zone lines, the corner between the covering stroma and basal stroma consisting of a very small amount of colorless, thin-walled angular cells, paraphyses branched near the apex and entangled to form a light yellow-brown epithecium 8–12 µm thick, subhymenium composed of colorless textura porrecta, and lacks periphysoids and hyphal bridges (Lin et al. 2001a).

Lophodermium rufum Y.R. Lin & K. Li on *Rhododendron maculiferum* subsp. *anhweiense* is easily distinguished from the new species by its much larger (620–1040 × 430–580 µm) subcuticular ascomata, well-developed rufous lips, covering and basal stroma consisting of textura angularis-epidermoidea, wider (8–10.5 µm) asci, shorter and wider (54–86 × 1.5–2 µm) ascospores containing many granules, unbranched paraphyses slightly gradually swollen at the apex (Lin et al. 2001b).

Acknowledgments

The authors are grateful to Dr J.E. Taylor and Dr M. Ye for pre-submission reviews leading to the improvement of our manuscript, and to Mr F. Zhou and Ms L. Zhang for the field investigations. This study was supported by the National Natural Science Foundation of China (No. 31270065, 31170019).

Literature cited

Chen JL, Lin YR, Hou CL, Wang SJ. 2012 ["2011"]. Species of *Rhytismataceae* on *Camellia* spp. from the Chinese mainland. Mycotaxon 118: 219–230. http://dx.doi.org/10.5248/118.219

Chen L, D.W. Minter, Wang SJ, Lin YR. 2013. Two new species of *Rhytismataceae* on fagaceous trees from Anhui, China. Mycotaxon 126: 109–120. http://dx.doi.org/10.5248/126.109

Gao XM, Lin YR, Huang HY, Hou CL. 2013. A new species of *Lophodermium* associated with the needle cast of Cathay silver fir. Mycological Progress 12: 141–149. http://dx.doi.org/10.1007/s11557-012-0817-y

Hou CL, Piepenbring M. 2009. *Lophodermium puerense* sp. nov. on needles of *Pinus yunnanensis* var. *tenuifolia* from southwest Yunnan. Mycotaxon 107: 259–262. http://dx.doi.org/10.5248/107.259

Lin YR, Liu HY, Hou CL, Wang SJ, Ye M, Huang CL, Xiang Y, Yu SM. 2012. Flora fungorum sinicorum, vol. 40, *Rhytismatales* [in Chinese]. Science Press, Beijing. 261p.

Lin YR, Xu ZS, Li K. 2001a. Two new species of the genus *Lophodermium* from the Huangshan Mountains [in Chinese]. Mycosystema 20: 457–460.

Lin YR, Xu ZS, Li K, Xie YS. 2001b. Two new species of *Lophodermium* Chev. on Anhwei rhododendron [in Chinese]. Journal of Anhui Agricultural University 28: 358–361.

Lu DD, Tang YP, Wang LH, Wang SJ, Lin YR. 2015 ["2014"]. *Lophodermium quadrisporum* sp. nov. (*Rhytismataceae*) on *Rhododendron faberi* subsp. *prattii*. Mycotaxon 129(2): 459–463. http://dx.doi.org/10.5248/129.459

Luo JT, Lin YR, Shi GK, Hou CL. 2010. *Lophodermium* on needles of conifers from Yunnan Province, China. Mycological Progress 9:235–244. http://dx.doi.org/10.1007/s11557-009-0632-2

Shi GK, Luo JT, Hou CL. 2010. Species of the *Rhytismataceae* on *Pinus armandii* [in Chinese]. Mycosystema 29(2): 159-163.

Wang SJ, D.W. Minter, Gao XM, Lin YR. 2012. A new species of *Lophodermium* on *Saccharum arundinaceum* [in Chinese]. Mycosystema 31(4): 471–475.

Wang SJ, Xu YF, Tang YP, Li Q, Lin YR. 2014. *Lophodermium urniforme,* a new species of *Rhytismataceae* from China. Mycosystema 33(4): 768–772. http://dx.doi.org/10.13346/j.mycosystema.140029